General Maintenance Requirements for Surgical Microscopes

Maintenance Information

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ZEISS

About This Manual

Regular inspection and maintenance is required to ensure high quality and performance of the system on an ongoing basis. Compliance with the maintenance intervals specified in this manual ensures consistent and reliable performance of your surgical microscope.
If you have any questions, please contact your local ZEISS Service team or an authorized ZEISS dealer.

Manufacturer

Carl Zeiss Meditec AG
Goeschwitzer Strasse 51-52
07745 Jena
Germany

Fax: + 49 (0) 7364 - 20 4823
E-Mail: surgical@meditec.zeiss.com
Internet: www.meditec.zeiss.com

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Maintenance intervals

Regular preventive maintenance is required to ensure reliable and consistent operation of the system.

The following table lists the relevant maintenance activities and shows at which intervals they must be performed.
This is only a general overview. If components are listed which are not available on your system, the maintenance described is not applicable.

Much maintenance work not detailed here requires system-specific expert know-how. It is frequently necessary to open the system for this work which may only be performed by authorized service staff.
Please contact your local ZEISS service representative in due time for the performance of these maintenance activities.

If you notice during your own tests according to the microscope's instructions for use that the system does not correspond to the acceptance criteria, you must no longer use the system. Please shut the system down and contact your local ZEISS service partner.

Regardless of the maintenance work listed, users of medical electrical equipment are obligated to perform recurrent tests in accordance with IEC 62353.

Prior to each use

Component	Activity, inspection features and acceptance criteria
Brakes	• Electrical and mechanical function test – Brakes unlock completely when release buttons are pressed. – The braking force holds the microscope securely in balanced state without any change of position. – The friction brakes can be set to move smoothly and without play. – The locking tabs of the casters prevent the system from rolling away.
Illumination	• Visual inspection and function test – The service hours of the lamp are within the permissible range. – Backup lamp is available and ready for use. • Exchange the lamp if it is defective or when the maximum service hours have been exceeded. • Exchange the xenon bulb after max. 500 h or max. 6 months.

Every 12 months

Component	Activity, inspection features and acceptance criteria
Documentation and identification labels	• Visual inspection – Manuals and identification labels are available, undamaged, complete and legible.
Controls	• Visual inspection and function test – Optical and acoustic signals are functional and react on activation or in the respective operating mode. – Emergency backup systems (e.g. second lamp) are functional. – The buttons are smooth and without play. – Electrical connections and insulation are undamaged.

Component	Activity, inspection features and acceptance criteria
Light guide	• Visual inspection – The sheathing of the light guide is without kink or dents. – The field of view is illuminated homogeneously.
Stand column	• Visual inspection and function test – The column is securely positioned without mechanical play in the column connection. – The motion of the lifting column is jolt-free.
Casters	• Visual inspection and function test – The casters are properly mounted on the stand. – The running surface of the casters does not display any damages. – Rotary and rolling motions are unblocked. – Locking tabs and brakes are properly mounted and prevent the system from rolling away.
Fan of the illumination system	• Function test – The fan runs inconspicuously. – Vacuum capacity is noticeable (paper test). – The fan is free from dust and lint. • Clean the fan. • Function test – The fan's filter is free from dust and lint. • Clean the fan's filter or exchange it if necessary.
Microscope	• Function test – The optical image is clear. – The field of view is fully illuminated.
Zoom and focus	• Function test – The zoom system runs smoothly and jolt-free. – Zoom and focus can be adjusted manually to be jolt-free and run smoothly.

Component	Activity, inspection features and acceptance criteria
Objective lens, tube and other accessories mounted to the microscope (camera, etc.):	• Visual inspection and function test – Additional parts are attached properly and without play. – Knurled screws are available, undamaged and firmly tightened. – Handgrips and other removable microscope components are properly attached.
Cables, connectors	• Visual inspection and function test – Insulation and connectors on the system and cables are undamaged. – Fuses are installed and undamaged. The fuse value corresponds to the specifications in the user manual. – Cables with and without ducts are free from dents and damage. – Cables with and without ducts are protected against shearing, e.g. through other devices. – The strain relief device of the cables functions properly and is not canted.
Foot control panel	• Visual inspection and function test – The housing is undamaged. – Buttons and switches as well as the joystick move freely and function properly. – The dust and spray water protection device is undamaged and complete.
Monitor	• Visual inspection and function test – The housing is undamaged. – Image quality is OK. No noticeable color tinge.
Gas pressure spring	• Function test – Movement of the gas pressure spring is homogeneous and jolt-free. – The gas pressure spring is not operated in the limit range.

Every 2 years

Component	Activity, inspection features and acceptance criteria
Carrier system including microscope mount and XY coupling	• Visual inspection and function test – No signs of crack formation or wear on the supporting structure. – Smooth and play-free bearings. – Stops and suspensions are correctly positioned and undamaged. – No noticeable cracks, signs of wear or damage on connecting elements, suspensions and couplings. – No damage or wear on the connection and mount of the compensating weights.
Optical filters	• Visual inspection – Heat-absorbing filter and UV filter are safely positioned and undamaged.
Batteries (e.g. in UPS, mainboard, foot control panel)	• Exchange the batteries.

Every 4 years

Component	Activity, inspection features and acceptance criteria
Casters	• Exchange the casters.
Gas pressure spring	• Exchange the gas pressure spring

Every 6 years

Component	Activity, inspection features and acceptance criteria
Light guide	• Exchange the light guide.

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